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09/630,915	08/02/2000	Monsieur Bernard Bidet	33396-070337.0205	7905

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EXAMINER
FISCHER, JUSTIN R

ART UNIT	PAPER NUMBER
1733	13

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/630,915	BIDET, MONSIEUR BERNARD	
	Examiner	Art Unit	
	Justin R Fischer	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *12* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 8-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama (JP 55-36266, of record) in view of Suzuki (US 4,500,672, of record). Mayama and Suzuki are applied in the same manner as set forth in Paper Number 9, Paragraph 2.

Mayama discloses a pneumatic tire construction having an innermost, air impermeable layer (innerliner), an intermediate reinforcing layer, and a outer carcass layer, in relation to said innerliner and intermediate layer. In describing said intermediate layer, Mayama suggests a composition comprising natural rubber and styrene butadiene rubber (copolymer of one or more conjugated diene polymers and one or more vinyl aromatic polymers). Table 3 clearly discloses a plurality of inventive compositions (A-F) for the intermediate layer having both natural rubber (RSS #3) and styrene butadiene rubber (SBR 1500), although the reference is more generally directed to the use of natural rubber and/or a synthetic diene rubber (does not specifically require SBR 1500). The reference further suggests the use of a variety of carbon blacks in the intermediate layer in an amount that is less than 50 phr, including HAF, FEF, and GPF (Table 1). However, Mayama is silent with respect to (a) the properties

of the carbon black (BET surface area and DBP) oil absorption) and (b) the specific makeup of the styrene butadiene copolymer (i.e. 1,2 bond content in butadiene portion (D) and vinyl aromatic chain content (VA)). Regarding the carbon black, one of ordinary skill in the art at the time of the invention would have recognized the well known carbon black fillers of Mayama (HAF, FEF, GPF) as having properties that satisfied the broad quantitative limitation of the claimed invention, as further evidenced by Suzuki (Table 8). With respect to the styrene butadiene copolymer, the four quantitative relationships required by the claimed invention define a plurality of well known SBR copolymers and one of ordinary skill in the art at the time of the invention would have readily appreciated the SBR 1500 of Mayama, and more broadly a large number of synthetic diene rubbers, as meeting the quantitative limitations of the claimed invention. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the intermediate layer of Mayama from a rubber composition including carbon black and SBR copolymer in accordance to the limitations of the claimed invention, as set forth below.

It is initially noted that claims 1 and 2 contain the following language: copolymer prepared in solution. This language represents a method limitation that fails to further define the structure of the claimed article. In particular, applicant has not provided any evidence to suggest that a materially different copolymer results from a solution polymerization technique as compared to additional techniques, such as emulsion polymerization.

Regarding the carbon black makeup required by claim 1, Mayama suggests the use of one of several, well known carbon blacks in an amount less than 50 phr,

including HAF (N330), FEF (N550), and GPF. While Mayama fails to include the BET and DBP properties, one of ordinary skill in the art at the time of the invention would have recognized that the quantitative relationship of the claimed invention is satisfied by many of the well known carbon blacks disclosed by Mayama in view of conventional carbon black properties, as evidenced by Suzuki. In this instance, Suzuki discloses the conventional DBP number for HAF (N330) and FEF (N550), respectively: 101 ml/100 grams and 115 ml/100 grams (Table 2, Examples 7 and 8). To satisfy the quantitative relationship of the claimed invention, then, the BET surface area would have to be less than approximately 101 m^2/gram and 85 m^2/gram, respectively. One of ordinary skill in the art at the time of the invention would have readily appreciated and expected the carbon blacks of Mayama to have the necessary BET surface area values as they define an extremely broad range and include a plurality of values that are ordinarily associated with HAF and FEF. Furthermore, applicant has not provided any unexpected results to establish a criticality for the carbon black of the claimed invention and as such, it would have been obvious to select a carbon black that satisfied the quantitative relationship of the claimed invention in view of Mayama and Suzuki. It should be noted that Table 3 is not evidence of "unexpected results". The composition of Test 8 varies from each of Tests 7, 9, and 10 in that more than one variable is altered (base rubber composition, additive materials and quantities) and as such, there is no conclusive evidence that the realized benefits can be attributed to the specific carbon black.

As per the four quantitative relationships defining the makeup of the copolymer, it should initially be noted that limitations (iii) and (iv), which require a 1, 2 bond content

and a vinyl aromatic content greater than 10%, would have been readily appreciated by one of ordinary skill in the art at the time of the invention. They define an extremely broad range between 10 and 100% for each of the respective chain contents that define well-known and extensively used SBR compositions in the tire industry. With respect to limitations (i) and (ii), applicant defines a very broad range to relate the aforementioned bond/chain contents. For example, in taking a conventional value of 20% for VA, the quantitative relationship requires that D is between 25 and 83.2, which defines a large range of conventional values for the 1,2 bond content. Additional conventional values, such as 35% for VA, suggest that D would have to be between 0 and 58, which again defines a broad and conventional range for the 1,2 bond content. Thus, it is evident that the quantitative relationships defined by applicant are satisfied by several embodiments in which the bond/chain contents take on conventional values. Furthermore, applicant has not established any criticality in the formation of the aforementioned quantitative relationships that would define over the use of conventional bond/chain content values. In Tables 1 and 3, both SBR A and SBR B satisfy the quantitative limitations of the claimed of invention, and as such, there is nothing of record to clearly evidence the benefits of SBR copolymers that meet the aforementioned limitations as compared to those that don't. It is further noted that applicant states that it is known in the art that SBR 1500 has values of D and VA equal to 18.9% and 23.5%, respectively (Paper Number 11, Page 10). In turn, all of the limitations required by (i) through (iv) in claim 1 are satisfied.

Regarding claim 2, the natural rubber suggested by Mayama (RSS or rib smoked sheet) would have been recognized by one of ordinary skill in the art at the time of the

invention as having an extremely high cis 1,4 bond content (90-100 %), and in particular well above 80 %. Also, regarding the limitations (i) and (ii), Mayama suggests that natural rubber and/or a synthetic diene rubber are used to form the intermediate rubber layer. The reference further states that an example of such a composition includes natural rubber and SBR 1500, as set forth in Page 2, Column 2. As previously stated (above and Paper Number 9, Page 4 and Page 11), though, the reference is not limited to the use of SBR 1500 (specific copolymer)- the reference is more generally directed to the use of a synthetic diene rubber. One of ordinary skill in the art at the time of the invention would have recognized that the quantitative relationships of the claimed invention (i-iv) describe well known and extensively used synthetic diene rubbers, including copolymers such as other SBR compounds, there being no conclusive evidence of unexpected results to establish a criticality for a rubber composition in accordance to the limitations of the claimed invention, as detailed in the previous paragraph.

With respect to claim 8, Mayama defines a plurality of compositions for the intermediate layer in which the stearic acid component is in an amount of 2.5 phr (Table 3). While the reference fails to expressly provide a range for the stearic acid or describe a specific embodiment in which the stearic acid is less than 2 phr, one of ordinary skill in the art at the time of the invention would have found it obvious to use stearic acid in a variety of amounts in accordance to well known and conventional tire rubber composition manufacture. It is well known that stearic acid defines one of several general additives that are included in tire rubber compositions, wherein said additives are added in a small amount that usually varies on the order of 1-5 phr. As such, using

stearic acid in an amount between 0 and 2 phr would have been obvious to one of ordinary skill in the art at the time of the invention, there being no evidence of unexpected results due to the stearic acid amount.

As per claim 9, Mayama suggests the use of zinc oxide in an amount of 3 phr in compositions A-F of Table 3, it being further noted that additional amounts within the claimed range would have been within the purview of one of ordinary skill in the art at the time of the invention.

Regarding claim 10, Mayama describes the use of sulfur in an amount of 2 phr in compositions A-F of Table 3, it being further noted that additional amounts within the claimed range would have been within the purview of one of ordinary skill in the art at the time of the invention.

With respect to claim 11, Mayama includes several embodiments in which the thickness of the intermediate layer is varied. In Example 1 of Mayama (Table 4), the intermediate layer has a thickness of 1 millimeter, wherein the rubber composition of this embodiment contains natural rubber and SBR copolymer.

Regarding claim 13, Mayama is generally directed to tubeless pneumatic tires, wherein one of ordinary skill in the art at the time of the invention would have readily appreciated the use of the assembly of Mayama in a heavy-duty tire construction as the benefits disclosed by Mayama (reduced ply thickness and maintaining tire weight) are equally desirable in heavy-duty tires. It is further noted that, as currently drafted, the language "for a motor vehicle bearing a heavy load" defines the intended use of the tire without further defining the tire structure. It is suggested that claim 13 define the tire as a "heavy-duty" tire if such a construction is desired.

3. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama and Suzuki as applied to claim 1 above, and further in view of Materne (US 6,156,822, of record). Mayama and Suzuki are applied in the same manner as set forth in Paper Number 9, Paragraph 3.

The references, however, fail to suggest the use of additional filler components, such as silica or modified carbon black, wherein surface-active groups (silica or aluminum) are present. In any event, it is extremely well known in the tire industry to include multiple reinforcing fillers in tire rubber compositions and furthermore, to modify the surfaces of either individual or multiple filler assemblies with hydroxyl groups. For example, Materne describes a tire rubber composition in which fillers such as carbon black, precipitated silica, and other fillers containing hydroxyl groups on their surface (i.e. aluminum doped precipitated silica and modified carbon blacks) are included. The use of both carbon black and silica allows a given rubber composition to have enhanced reinforcement capabilities since the recognized benefits of each filler can be realized. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to form a reinforcing assembly with (a) carbon black and doped silica (AlOH or SiOH) or (b) modified carbon black with AlOH or SiOH. It should be noted that the use of surface agents is not limited to the tread portion since the increase in reinforcement capability is desired in all rubber tire components, including the intermediate layer of Mayama. Lastly, Mayama specifies that less than 50 phr of carbon black is desired, thus suggesting that the use of an additional, well known reinforcing filler would be in an amount less than 50 phr.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama, Suzuki, and Materne as applied to claim 3 above, and further in view of Nakamura (US 6,333,375, of record). Mayama, Suzuki, and Materne are applied in the same manner as set forth in Paper number 9, Paragraph 4.

In this instance, the use of well-known silica having surface-active agents would have been obvious to one of ordinary skill in the art at the time of the invention, as evidenced by Materne. While Materne fails to describe the BET specific surface area, the range of the claimed invention is extremely broad and defines conventional values for silica compounds used in the tire industry, as evidenced by Nakamura. In this instance, Nakamura suggests a silica filler having a preferred BET range of 100-250 m^2/gram, more preferably 120-190 m^2/gram (Column 12, Lines 21-32). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a silica with the claimed BET surface area since the limitations of the claimed invention define well-known silica fillers that provide the necessary reinforcement capability.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama and Suzuki as applied to claim 1 above, and further in view of Sturm (US 5,504,159, of record). Mayama and Suzuki are applied in the same manner as set forth in Paper Number 9, Paragraph 5.

In describing the intermediate layer composition, Mayama suggests that a plurality of well-known additives, including processing oils, acceleration agents (1.2 phr), aging prevention agents (1.5-2 phr), stearic acid, and sulfur, can be incorporated into the base rubber composition. While the reference fails to expressly describe the use of

p-phenylene diamine (antioxidant/antiozonant), it is well known in the tire industry to include such a compound in rubber compositions to eliminate degradation caused by oxidation, as evidenced by Sturm (Column 1, Lines 10-20). The reference further states that typical amounts of antioxidants/antiozonants are 1-5 phr, which mimics the broad range of the claimed invention. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to include p-phenylene in an amount between 1 and 5 phr in the intermediate rubber composition of Mayama, in view of well known rubber compounding techniques and further evidenced by Sturm.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama and Suzuki as applied to claim 1 above, and further in view of King (US 3,563,928, of record). Mayama and Suzuki are applied in the same manner as set forth Paper Number 9, Paragraph 6.

In describing the intermediate rubber layer composition, Mayama suggests the use of a plurality of well known additives, including but not limited to sulfur, stearic acid, and processing oils. However, the reference fails to suggest the use of a metal salt (cobalt, nickel, or iron) selected from the group consisting of (a) organic salts or (b) hydroxides in an amount between 0.03 and 3 phr. In any event, metal salts represent a well known additive that is conventionally used in tire rubber compositions to improve the tackiness or adhesion characteristics of a given rubber component, as evidenced by King (Column 2, Lines 10-14 and Lines 30-40). In particular, King discloses the use of an organic salt in the amount of 0.5-10 phr, which incorporates nearly the entire range of the claimed invention. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a metal salt in the intermediate layer of

Mayama, in view of King, for the benefits of improved tack. It should lastly be noted that the intermediate layer of Mayama functions as a bonding agent for the innerliner and the carcass and as such, enhanced tack would be especially desirable in the intermediate layer of Mayama (in addition to natural rubber, which also promotes tack).

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama and Suzuki as applied in claims 1 and 2 above, and further in view of Gros (US 3,884,993, newly cited). In describing the rubber composition for the intermediate layer, Mayama describes the inclusion of carbon black and further suggests that conventional additives can be included. While the reference fails to expressly describe the use of kaolin (clay), kaolin is an extremely well known and conventional reinforcing filler that is extensively used in the tire industry, as shown for example by Gros (Column 6, Lines 38-47). In particular, it is known to include multiple reinforcing fillers, such as carbon black and kaolin, to optimize a wider range of properties/characteristics, including modulus, rolling resistance, and cost. Furthermore, applicant has not provided a conclusive showing of unexpected results to establish a criticality for the use of kaolin in the intermediate rubber composition and as such, it would have been obvious to one of ordinary skill in the art at the time of the invention to include kaolin in the intermediate rubber composition of Mayama for the benefits detailed above.

Response to Arguments

8. Applicant's arguments filed March 17, 2003 have been considered but they are not persuasive. Applicant argues that (a) Mayama does not each the combination of natural/synthetic polyisoprene and a copolymer of diene monomers and vinyl aromatic monomers, (b) the SBR 1500 copolymer disclosed by Mayama is recognized as being

prepared in emulsion while the claim requires in solution, and (c) the properties of SBR 1500 do not satisfy the quantitative relationships of claim 2.

Regarding (a), as acknowledged by applicant, Mayama clearly states that the intermediate rubber composition is formed of natural rubber and/or a synthetic diene rubber. In describing an example composition for the intermediate rubber layer, Mayama (Page 2, Column 2) specifically describes the inclusion of both natural rubber (80 phr) and SBR 1500 (20 phr), wherein SBR 1500 is a copolymer of one or more conjugated diene monomers (butadiene) and one or more vinyl aromatic monomers (styrene).

With respect to (b), as stated above, the language "prepared in solution" is a method limitation that fails to further define the structure of the claimed tire article. Applicant has not provided any evidence to suggest that a materially different copolymer results from a solution polymerization technique as compared to an emulsion polymerization technique. It is noted that both techniques are well known in the industry, such that emulsion polymerization and solution polymerization are used to form random copolymers (SBR 1500 is a random copolymer) and solution polymerization is used to form block copolymers. In particular, solution polymerization affords the ability to better control the average molecular weight and weight distribution, among other characteristics. However, it does not appear that a materially different copolymer results from the respective polymerization techniques to further define the tire article of the claimed invention.

Regarding (c), as stated in Paper Number 9, Pages 4 and 11, the quantitative relationships required by the claimed invention define a large number of well known and

extensively used synthetic diene rubbers. The example composition of Mayama includes SBR 1500 as the synthetic diene rubber, which as pointed out by applicant, meets the quantitative relationships in claim 1. While SBR 1500 only satisfies three of the four quantitative relationships in claim 2 (not (i)), the reference is not limited to the use of SBR 1500- the reference is more generally directed to the use of synthetic diene rubbers. The use of additional copolymers that satisfy (i)-(iv) in claim 2, such as other SBR compounds, would have been within the purview of one of ordinary skill in the art at the time of the invention since they define well known and extensively used copolymers in the tire industry and absent any conclusive showing of unexpected results. Lastly, as previously noted, Tables 1-4 are not found to be evidence of unexpected results.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(703) 605-4397**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Justin Fischer

May 21, 2003

Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700